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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/527,761	03/17/2000	Brian C. Barker	BU9-99-157	3261

7590

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EXAMINER

LEE, SEUNG H

ART UNIT	PAPER NUMBER
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2876

DATE MAILED: 09/11/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/527,761

Applicant(s)

BARKER ET AL.

Examiner

Seung H Lee

Art Unit

2876

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 30 May 2002.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-67 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-56, 58-61 and 63-67 is/are rejected.
- 7) ☒ Claim(s) 57, 62 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

1. Receipt is acknowledged of the response filed on 30 May 2002, which has been entered in the file.

Specification

2. Claim 37 is objected to because of the following informalities:
Re claim 37, line 3: Substitute "other that" with --other than--.
Appropriate correction is required.

Claim Rejections - 35 USC § 112

3. Claims 1, 37, and 51 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

The phrase "information providing pattern other than a bar code pattern" in claims 1 and 51 and "a digital from other than a bar code pattern" in claim 37 are unclear. It is vague and indefinite to the examiner what the applicant is intending to describe of that pattern or form, that is, the applicant clearly disclose that a bar code type indicia is used for presenting information regarding a particular wafer as shown in figure 10. Moreover, the examiner is confused by term "a digital information-providing pattern" and "a bar code pattern" in the claims, that is, what are the bar code pattern and the digital information-providing pattern? In general, the barcode is presenting the information using a plurality of indicia in such way that if the indicia are representing

"on" or "0" then the space between the indicia would represent "off" or "1". Accordingly, given its broadest reasonable interpretation, "the digital information-providing pattern" can be used interchangeably with "the bar code pattern".

Appropriate clarification and correction is required.

Claim Rejections - 35 USC § 102

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

The changes made to 35 U.S.C. 102(e) by the American Inventors Protection Act of 1999 (AIPA) do not apply to the examination of this application as the application being examined was not (1) filed on or after November 29, 2000, or (2) voluntarily published under 35 U.S.C. 122(b). Therefore, this application is examined under 35 U.S.C. 102(e) prior to the amendment by the AIPA (pre-AIPA 35 U.S.C. 102(e)).

5. Claims 1, 2, 6, 9, 13, 22, 37, 40, 43-45, 51, 54, 55, 58, 60, 63, and 64 are rejected under 35 U.S.C. 102(e) as being anticipated by Bacchi et al (US 5,894,348)(hereinafter referred to as 'Bacchi').

Bacchi teaches a plurality of pits or scribe markers (18) shaped in circle, wherein the markers are located on a front side of the semiconductor wafer (20) in which the pits are arranged in digital information-providing pattern (i.e., alphanumeric characters) wherein a scribe mark reader (10) reads the pits during production process using diode

array (16), and the adequate or detectable contrast between the background and the image of the mark, the markers are readable by a reader's eye, the pits (28) are oriented differently defined by each of an associated axis (see Figs. 1, 3-5; col. 1, lines 15-49).

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. Claims 7, 8, 10, 16, 21, 27-30, 33-35, and 38 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bacchi in view of Duncan et al (US 4,585,931, of the record)(hereinafter referred to as 'Duncan').

The teachings of Bacchi have been discussed above.

In addition to the teachings of Bacchi as discussed above, he also teaches a character is consist of a plurality of pits (28) having a space between each pits (see Fig. 5, col. 4, line 13-24).

However, Bacchi teaches the pits are arranged in information providing pattern, he fails to teach or fairly suggest that the pattern have long and short pits.

Duncan teaches that the bar codes on the wafer are varying by width and height or a first shape and a second shape and the light striking spaces (21) between the pits (15 and 18) form the interference fringes in which defines by the depth of the space (21)

and the rays of light are reflected with a phase change (θ) (39, 39', 39", and 39''') wherein the reflected beam does not reaches the sensing device (39) considered as non-reflected (see Figs. 1-3; col. 3, lines 49-60; col. 5, line 21-47).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the teachings of Duncan to the teachings of Bacchi in order to improve the readability of the information mark of the wafer by scattering the rays of light onto the surface of the wafer. Although, Bacchi as modified by Duncan and Young fail to particularly teach or fairly suggest that the height and width of the pits and the distance between each pits, it would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the teachings of Duncan to the teachings of Bacchi, since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. *In re Aller*, 105 USPQ 233. Although, Bacchi as modified by Duncan fail to particularly teach that the each space comprises 2 columns each comprising 32 pits, it would have been an obvious design variation well within the ordinary skill in the art failing to provide any unexpected results for readings the pits using the 32 pits reading device, and therefore an obvious expedient.

8. Claims 11, 12, 17-19, and 41 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bacchi in view of Young et al (US 5,792,566, of the record)(hereinafter referred to as 'Young').

The teachings of Bacchi have been discussed above.

Although, Bacchi teaches that the pits are on the semiconductor wafer, they fail to teach or fairly suggest that the pits are perpendicular to a top surface and a bottom surface of the wafer.

However, Young teaches the pit (172) is grooved on the side surface of the wafer extending from the front surface of the wafer to a back surface of the wafer when the wafer of Fig.1 is cut horizontally wherein the pit is perpendicular to a top surface and a bottom surface of the wafer (see Fig. 1-3; col. 2, line 55- col. 4, line 3).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the teachings of Young to the teachings of Bacchi in order to align/stack the wafers by matching the information mark or pits of wafers. Moreover, such modification would provide the faster processing means by aligning/stacking the wafers based on the pits provided thereon which is in the position for next processing steps. Although, Bacchi as modified by Young fail to particularly teach that the groove is curved on the boule, it would have been an obvious design variation well within the ordinary skill in the art failing to provide any unexpected results for aligning/stacking the wafer by the matching location of the pits of wafer, and therefore an obvious expedient.

9. Claims 23-26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bacchi as modified by Duncan, and further in view of Young et al (US 5,792,566, of the record)(hereinafter referred to as 'Young').

The teachings of Bacchi/Duncan have been discussed above.

Although, Bacchi/Duncan teach that the pits are on the semiconductor wafer, they fail to teach or fairly suggest that the pits are arranged the back surface of the wafer.

However, Young teaches the pit (172) is grooved on the side surface of the wafer extending from the front surface of the wafer to a back surface of the wafer when the wafer of Fig.1 is cut horizontally wherein the pit is perpendicular to a top surface and a bottom surface of the wafer (see Fig. 1-3; col. 2, line 55- col. 4, line 3).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the teachings of Young to the teachings of Bacchi/Duncan in order to align/stack the wafers by matching the information mark or pits of wafers located on the back surface of the wafer, and therefore an obvious expedient.

10. Claims 14 and 52 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bacchi in view of Yano et al (US 6,268,641, of the record)(hereinafter referred to as 'Yano').

The teachings of Bacchi have been discussed above.

Although, Bacchi teaches that the pits on the semiconductor wafer, they fail to teach or fairly suggest that a laser reading device is reading information.

However, Yano teaches the laser-reading device can be used for reading of the identification mark (16) on the wafer.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to substitute the conventional laser reading device of the Yano for the reader of the Bacchi in order to provide an improved reading means the information is canned precisely and accurately using the laser reading device, and therefore an obvious expedient.

11. Claims 15, 36, and 42 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bacchi in view of Brown et al. (US 5,976,768)(hereinafter referred to as 'Brown').

The teachings of Bacchi have been discussed above.

Although, Bacchi teaches that the pits on the semiconductor wafer, they fail to teach or fairly suggest that the pits is coated with silicon carbide.

However, Brown teaches the wafer (2400) having an implants (2408) in which are separated by space troughs (2802), and a silicon dioxide material (302) is coated and filled the implant and the space troughs (see Figs. 31 and 33; col. 15, line 45- col. 16, line 14).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the teachings Brown to the teachings of Bacchi in order to prevent/reduce the wear-off and tear-off of the surface of the wafer by coating the surface of the wafer. Moreover, such modification would provide the clear reading of the pits since the coating of the wafer surface prevent dust materials from resting within the pits, and therefore an obvious expedient.

12. Claims 20, 31, 32, and 39 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bacchi in view of Iwai (US 4,418,567, of the record).

The teachings of Bacchi have been discussed above.

Although, Bacchi teaches that the pits on the semiconductor wafer, they fail to teach or fairly suggest that the pits having a location reference information.

However, Iwai teaches that a location mark (114) providing the location information and information marks (116a, 116b, and 116c) providing the wafer's information on the curved sidewalls (see Figs. 9 and 11; col. 7, lines 6-24).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the teachings Brown to the teachings of Bacchi in order to an easier recognition of the information means the operator(s) can verify/acknowledge the information written on the wafer without using particular device to decode the information thereon the wafer. Moreover, such modification would provide an automated processing, that is, the operator(s) or computer can be instructed the processing procedure by decoding/reading the information marks, and therefore an obvious expedient.

13. Claim 53 rejected under 35 U.S.C. 103(a) as being unpatentable over Bacchi in view of Makinouchi et al (US 4,958,082)(hereinafter referred to as 'Makinouchi').

The teachings of Bacchi have been discussed above.

Although, Bacchi teaches that the reading device for reading the pits on the semiconductor wafer, they fail to teach or fairly suggest that the reading device comprises an interferometer.

However, Makinouchi teaches the position of wafer (2) is detected by the interferometer (2) (see Figs. 1 and 2; col. col. 1, lines 12-60).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the teachings Makinouchi to the teachings of Bacchi in order to an improved and an enhanced means for detecting the orientation of the wafer automatically using the interferometer. Moreover, such modification would speed-up the reading process of the information written on the wafer since the reading device cane be focus on targets area using the interferometer, and therefore an obvious expedient.

14. Claims 46-50 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bacchi in view of Moh et al (US 6,214,250, of the record)(hereinafter referred to as 'Moh').

The teachings of Bacchi have been discussed above.

Although, Bacchi teaches that the pits on the semiconductor wafer contrast with surrounding portion of wafer, they fail to teach or fairly suggest that the pits are altered and invalidated.

However, Moh teaches labels are changed during the course of process wherein the code patterns formed previously are altered to invalidate (see col. 2, line 61- col. 3, line 38).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the teachings of Moh to the teachings of Bacchi in order to provide an enhanced reading means by recognizing the pits having a different color contrasting with region around the pits. Moreover, such modification would provide an user friendly processing means operator(s) can verify/acknowledge/check the status of the process by reading the code patterns on the wafer at any given particular time since the code patterns are changing/updating constantly as each processing step is completed, and therefore an obvious expedient.

15. Claims 3-5 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bacchi in view of Moh and Huang et al (US 5,330,924)(hereinafter referred to as 'Huang').

The teachings of Bacchi and Moh have been discussed above.

Although, Bacchi as modified by Moh teach that the pits on the semiconductor wafer contrast with surrounding portion of wafer, they fail to teach or fairly suggest that the pits are arranged in the an ion implant region to provide a contrast.

However, Huang teaches that the ion implantation is used to characterize the wafer (see Figs. 7 and 8; col. 4, lines 36-54).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to substitute the well-known method of ion implant as taught by Huang with the method of composite label as taught by Bacchi as modified by Moh in order to provide the conductance to wafer, and therefore an obvious expedient.

16. Claim 59 is rejected under 35 U.S.C. 103(a) as being unpatentable over Bacchi in view of Wen (US 5,834,819).

The teachings of Bacchi have been discussed above.

Although, Bacchi teaches that the pits are arranged on the semiconductor wafer, he fails to teach or fairly suggest that the pattern of pits is a quaternary-coded pattern having at least three different shapes.

However, Wen teaches the quaternary code is used to encode the data (see Figs. 3A-3H; col. 5, lines 22-25).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the well-known the quaternary code system as taught by Wen to the teachings of Bacchi in order to increase the storage capacity, and therefore an obvious expedient.

17. Claims 56 and 61 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bacchi in view of Zhang (US 5,245,165).

The teachings of Bacchi have been discussed above.

Although, Bacchi teaches that the pits are arranged on the semiconductor wafer, he fails to teach or fairly suggest that the pattern of pits is comprised at least three different shapes.

However, Zhang teaches a glyph code having at least three different shapes (see Fig. 3; col. 2, lines 3-28; col. 3, lines 7-24).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the teachings of Zhang to the teachings of Bacchi in order to increase the storage capacity, and therefore an obvious expedient.

18. Claims 65-67 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bacchi in view of Grandia et al (US 4,084,354)(hereinafter referred to as 'Grandia').

The teachings of Bacchi have been discussed above.

Although, Bacchi teaches that the pits are arranged on the semiconductor wafer, he fails to teach or fairly suggest that the wafer boule having a sequence start notch along a longitudinal surface of boule and a helically shaped sequence notches along a longitudinal surface of boule.

However, Grandia teaches a wafer boule having the sequence start notches (44) along a longitudinal surface of boule and a helically shaped sequence notches (10) along a longitudinal surface of boule (see Figs. 1A and 4A; col. 1, lines 12-60; col. 3, lines 45-68).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the teachings of Grandia to the teachings of Bacchi

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in order to provide an improved and an enhanced cutting means the notches of wafer boule provide an crystallographic orientation of the wafer boule to align with cutting blade during the slicing operation. Although, Bacchi as modified by Grandia fail to particularly teach that the sequence start notches and a helically shaped sequence notches are arranged onto same wafer boule, it would have been an obvious design variation well within the ordinary skill in the art failing to provide any unexpected results for incorporating the two different notches type as taught by Grandia, and therefore an obvious expedient.

Allowable Subject Matter

19. Claims 57 and 62 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

20. The following is a statement of reasons for the indication of allowable subject matter:

Although, the best prior art of record to Bacchi, Zhang, and Wen teach the pits forming a quaternary code having different shape, Bacchi, Zhang, and Wen taken alone or in combination of other references, fail to specifically teach or fairly suggest that a pits includes a circle, an oval, and a rectangle as set forth in the claims.

Response to Arguments

21. Applicant's arguments with respect to claims 1-67 have been considered but are moot in view of the new ground(s) of rejection.

In response to the applicant argument that "Duncan et al. does not teach or suggest use of a digital information pattern, which is other than a bar code pattern." (see page 11 , line 1+), the Examiner respectfully provide the Bacchi reference wherein the Bacchi clearly shows the pits are digitally readable and the pits are not barcode pattern as discussed in paragraph 5 above.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of

the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure;

Matsui [US 5,897,669] discloses a information recording medium,

Pogge [US 4,256,514] discloses a forming of a silicon body.

Any inquiry concerning this communication or earlier communication from the examiner should be directed to Seung H. Lee whose telephone number is (703) 308-5894. The examiner can normally be reached on Monday to Friday from 7:30 AM to 4:00 PM.


If attempt to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael G. Lee, can be reached on (703) 305-3503. The fax-phone number for this group is (703) 308-5841 or (703) 308-7722.

Communications via Internet e-mail regarding this application, other than those under 35 U.S.C. 132 or which otherwise require a signature, may be used by the applicant and should be addressed to [michael.lee@uspto.gov].

All Internet e-mail communications will be made of record in the application file. PTO employees do not engage in Internet communications where there exists a possibility that sensitive information could be identified or exchanged unless the record includes a properly signed express waiver of the confidentiality requirements of 35 U.S.C. 122. This is more clearly set forth in the Interim Internet Usage Policy published in the Official Gazette of the Patent and Trademark on February 25, 1997 at 1195 OG 89.

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Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Group receptionist whose telephone number is (703) 308-0956.


Seung H. Lee
Art Unit 2876
August 27, 2002



KARL D. FRECH
PRIMARY EXAMINER